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PEPSI GROWS POTATOES IN CHINA

After entering China in 1982, Pepsi continued to do well in the country, offering a wider range of products than its arch-rival, Coca-Cola. Pepsi's potato chip business was successful despite competition from other multinational rivals and Chinese domestic brands. As its potato chips became more successful, however, the problem of how to secure a supply of quality potatoes also grew. In the North American market, Pepsi relied on external suppliers for its potatoes. But in China, it ran into problems sourcing locally as well as asking its US supplier to grow potatoes on its behalf in China. The matter was further complicated by the fact that the Chinese government had banned the import of potatoes. Faced with numerous obstacles in sourcing potatoes in China, how could Pepsi go about securing this critical input? Could it grow its own potatoes as it was already doing in other markets? If so, how could it secure the land needed to ensure that it would enjoy economy of scale? If it relied on subcontractors, could it build a stable and reliable pool of potato suppliers in China in the face of China's immature agribusiness industry?

China's Agribusiness

The Agricultural Sector

As part of the rural economic reform during the late 1970s, Deng Xiaoping decided to replace the communal system with the household responsibility system. The government withdrew its control on the cultivation of grains, giving rural farmers the power to decide what to grow for themselves.¹ Under the policy, many farmers began to grow fruits and vegetables, which enjoyed a higher market price, and kept only a small portion of their land for growing grains to feed their families.

Growing fruits and vegetables was a labour-intensive activity that tapped into China's competitive advantage of cheap labour. As the Chinese economy developed and opened to the

¹ Wang, Q.B. (March/April 2004) "China's Potato Industry and Potential Impacts on the Global Market", *American Journal of Potato Research*, http://findarticles.com/p/articles/mi_qa4069/is_200403/ai_n9369925/print (accessed 21 July 2007).

Grace Loo prepared this case under the supervision of Dr. Lu Jiangyong and Prof. Tao Zhigang for class discussion. This case is not intended to show effective or ineffective handling of decision or business processes.

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outside world, China's agricultural sector became more active in international markets and the country saw a rapid increase in the export of agricultural products. With the country producing almost half the world's vegetables and 16% of the world's fruits, the agribusiness industry in China was a burgeoning one.² During the first quarter of 2007, China's export of fresh food to the United States grew 279% to US\$7.4 million, with fresh vegetables growing 66% to US\$32 million.³ In the early 2000s, China dedicated an additional 5.7 million acres of land to the cultivation of vegetables, equivalent to more than half the land used for vegetable farming in the US. Many saw China's agricultural sector as having the potential to acquire the same international prowess as its manufacturing sector.⁴

The growth of China's agricultural sector was, to some extent, driven by the growth of supermarkets and hypermarkets such as Walmart and Carrefour, both inside and outside China, from which customers had come to expect seasonal fruits and vegetables year-round. In 2007, China had approximately 16,000 supermarkets and hypermarkets run by domestic and foreign operators. Another driver of China's agricultural sector was fast food chains such as McDonald's, which had around 800 outlets in China, and Kentucky Fried Chicken, with around 2,000. Modern supermarkets, hypermarkets and fast food chains required reliable sources of high quality and standardised produce, making procurement from a large number of small, independent farmers impractical.⁵ In 1988, long before McDonald's opened its first outlet in China, Idaho-based J.R. Simplot, one of the world's largest potato processors and a supplier to both McDonald's and Kentucky Fried Chicken, entered China in order to cultivate a reliable source of raw material for McDonald's french fries. These potatoes had to be long in shape, with shallow eyes and high sugar content.⁶ Simplot searched for the right site and right potato species to meet McDonald's requirements and spent years developing a reliable supply of potatoes at a loss. It did not open a potato processing plant in China until 1992. Simplot had to convince Chinese farmers, who had treated potatoes largely as a cash crop, to adopt a three-year growing cycle for growing potatoes commercially. Scale was a problem, as a farm needed about 250 acres to justify investment in tractors and fertilising machinery, and most Chinese farms were small and fragmented as a legacy of the economic reform in the late 1970s; there were some 200 million households with plots of land that averaged 1.5 acres in China. Only 7% of Chinese villages had formed farming cooperatives, though it was permitted by the Chinese government.⁷ Simplot persisted despite the obstacles and, by 2007, it had reduced the number of suppliers from more than 1,000 to about 100, mostly through working with large state-controlled farms or private businesses with land leased from local farmers.⁸ That year, its potato processing plant, which it had opened in 1992, was capable of producing one billion french fries a year.

The Simplot story reflected the development of China's agribusiness industry as it adapted to growing commercial demand. Agribusiness groups that enjoyed some economy of scale slowly began to emerge. Fujian-based Chaoda Modern Agricultural (Holdings) Ltd, the country's largest non-state-owned agribusiness group, had 29 production bases in 14 provinces in China. It specialised in organically grown fruits and vegetables, supplying its

² Gogoi, P. (23 May 2007) "China's Growing Exports: Food and Fear", *Business Week Online*, http://www.businessweek.com/print/bwdaily/dnflash/content/may2007/db20070523_447291.htm (accessed 21 July 2007).

³ Ibid.

⁴ Gogoi, P. (23 May 2007) op cit.

⁵ Dyer, G. (4 April 2007) "Taking the Countryside: Why Agribusiness May Reap Profits and Problems for China", *Financial Times*, p. 13.

⁶ Geng, Z.S., Hou, J.P. and Huang, H.B. (29 March 2004) "The Infinite Commercial Potential of the Potato Market in China", *Yunwang*, <http://www.yunnan.cn/238/2004/03/29/190@104886.htm> (accessed 21 July 2007).

⁷ Dyer, G. (4 April 2007) op cit.

⁸ Ibid.

wholesale and retail businesses across the country as well as its export business.⁹ Shanghai-based Aisen reared organic pigs in 12 pig farms near Shanghai and supplied mainly to big supermarkets. “Agribusiness is in its infancy at the moment in China but it is going to be one of the big phenomena of the next 10 years”, said Jonathan Anderson, Asia economist at investment bank UBS. “It is a good time to buy into a pig farm if you can.”¹⁰

The Food Processing Industry

China was one of the largest food-consuming countries in the world. With a rapidly rising standard of living and changing lifestyle, China’s food processing industry grew rapidly at an annual rate of 13.1% between 1980 and 2000.¹¹ With only 30% of the food consumed in China being processed, compared to an average of 80% in western nations,¹² the country’s food processing industry held vast potential. The flourishing of supermarkets, where 46% of processed food was sold, greatly promoted the purchase of processed foods.¹³

The food processing industry in China was highly fragmented, with many small companies owned by private owners. Chinese official statistics indicated 19,000 food processors with annual revenues of more than US\$600,000, while unofficial estimates put the number at about 900,000 ventures, covering both mom-and-pop operations and foreign corporations.¹⁴ In 2002, foreign enterprises comprised 14% of the food processing sector in 2001.¹⁵ Given the attractive opportunities the Chinese market offered, the percentage was expected to continue growing.

Infrastructure

China’s underdeveloped infrastructure, which was one of the weakest points of its economy,¹⁶ hampered the development of its agribusiness and food processing industry. The government was well aware of this and put a high priority on the development of energy, which was critical for the refrigeration, processing and transportation of produce. China’s poor railway system was being supplemented with a new highway system that was to form a grid spreading all over the country, enabling the efficient transportation of goods and produce.¹⁷

China’s Potato Industry

China’s 11.53 million square acres of potato farming area¹⁸ produced more than 20% of the world’s potatoes.¹⁹ With the dissolution of the Soviet Union, it became the largest potato-

⁹ Roberts, D. and Clifford, M.L. (10 September 2001) “Chaoda’s Green Revolution”, *Business Week Online*, http://www.businessweek.com/magazine/content/01_37/b3748155.htm (accessed 21 July 2007).

¹⁰ Dyer, G. (4 April 2007) op cit.

¹¹ Beijing Times (22 August 2002) “China to Promote Key Food Processing Industries”, http://english.peopledaily.com.cn/200303/11/eng20030311_113113.shtml (accessed 21 July 2007).

¹² United States Department of Agriculture (September 2005) “Food Processing in China Flourish”, <http://www.fas.usda.gov/info/fasworldwide/2005/09-2005/Chinafoodprocessing.pdf> (accessed 5 May 2007).

¹³ United States Department of Agriculture (September 2005) op cit.

¹⁴ Ibid.

¹⁵ Food & Drink Weekly (19 May 2003) “China: Opportunity for Food Processing Ingredient Exports.”

¹⁶ Wortman, M.S. and Mathias, E.D. (25–28 June 2000) “The Chinese Tiger: Strengthening the Infrastructure for the Future Growth of the Agribusiness”, paper presented at the Conference *Consumers, Technology, and the Environment: Creating Opportunity and Managing Risk*, World Congress of the International Agrifood and Agribusiness Management Association, Chicago, IL.

¹⁷ Ibid.

¹⁸ People’s Republic of China Ministry of Agriculture (28 March 2004) “The Status Quo and Prospect of the Potato Industry in China”, <http://www.potatocongress.org/include/powerpoint/28th/Chen%20Mengshan/The%20status%20quo%20and%20prospect%20of%20the%20potato%20industry%20in%20china.ppt#6> (accessed 10 September 2007).

growing country in the world. However, the country's annual per-capita consumption of potatoes was 18kg, which was quite low compared to 90kg in western Europe and 60kg in the US.²⁰

With the growing presence of fast food chains such as McDonald's and Kentucky Fried Chicken and with western food becoming more common, potatoes were gaining popularity in the Chinese diet. Domestic and international fast food chains drove the demand for frozen potato chips up at a rate of 5–10% in 2006.²¹ With few local companies possessing the resources or capability to produce frozen potato chips, 70% of the frozen potato products consumed in China were imported in 2005,²² with the United States supplying the most, followed by Canada and New Zealand.²³ China's potato processing industry was underdeveloped, hampered by the lack of integration between the industry and the agricultural sector and also by the lack of affordable domestically made machinery.²⁴ Only a few manufacturers could afford to import the required equipment from abroad.

China processed only about 5–10% of its potatoes.²⁵ Given its potato growing capacity and the country's rapid economic development, however, it was expected to be one of the few countries that would experience growth in the potato processing industry and trade.²⁶ The Chinese government was well aware of this potential. In 2002, the State Economic and Trade Commission and the Ministry of Agriculture jointly launched a five-year national program to restructure China's food processing industry. The potato processing industry, which covered the manufacturing of potato starch, potato-based convenience food and potato-based chemical adhesives, was targeted as one of the key industries for restructuring under the program. The government intended the industry to become one of the key industries driving the development of central and western China.²⁷

The launch of the national program quickly led to a flurry of activity to promote the development of the industry. Beijing prepared itself to become the country's potato processing centre, setting up a potato industrial park at Yanqing in the northwestern suburb of the city, and the Beijing Agricultural Bureau importing equipment to produce frozen potato chips, with plans to expand the production line capacity to 1,500 tonnes in a few years.²⁸ The Chinese government also signed numerous cooperative agreements with international agricultural research institutes on potato research and development. As China's agricultural sector was not well integrated with its food processing industry, new potato varieties were brought in from abroad and new species were developed to find one that was suitable for making fried potato chips and frozen chips.²⁹

¹⁹ United States Department of Agriculture (April 2004) "World Horticultural Trade and US Export Opportunities", Foreign Agricultural Service Attache Report, www.fas.usda.gov/http/Hort_Circular/2004/04-01-04%20Potato%20Article.pdf (accessed 21 July 2007).

²⁰ Zhou, C.Y. (22 March 2006) "A Brief Discussion of the Development and Market Prospect of Potato Snacks in China", *China Agriculture* 365, <http://zz.ag365.com/zhongzhi/datianzuowu/zhucangjiagong/2006/2006032231598.html> (accessed 4 March 2007).

²¹ Ibid.

²² Ibid.

²³ United States Foreign Agricultural Service (December 2004) "Frozen Potato Products and Situation Outlook for Selected Countries", World Horticultural Trade and U.S. Export Opportunities, Foreign Agricultural Service Attache Report, www.fas.usda.gov/http/Horticulture/Veg_Proc/12-07-04%20Potato%20Article.pdf (accessed 21 July 2007).

²⁴ Zhou, C.Y. (22 March 2006) op cit.

²⁵ US Foreign Agricultural Service (April 2004) "Frozen Potato Products and Situation Outlook for Selected Countries", World Horticultural Trade and U.S. Export Opportunities, Foreign Agricultural Service Attache Report, www.fas.usda.gov/http/Hort_Circular/2004/04-01-04%20Potato%20Article.pdf (accessed 1 September 2007).

²⁶ Ibid.

²⁷ Zhou, C.Y. (22 March 2006) op cit.

²⁸ Tang, M. (10 July 2003) "Chinese Fries to Rise", *China Daily*.

²⁹ Zhou, C.Y. (22 March 2006) op cit.

The Snack Market in China

In 2003, the value of the world snack food market was estimated at US\$66 billion.³⁰ The United States, which consumed about a third of the world's snacks, comprised the largest market. Japan and the United Kingdom followed with a combined consumption of a quarter of the world's snacks. The global demand for snack food was expected to continue rising as western eating habits spread to different parts of the globe and urban lifestyles diminished the role of traditional meals.³¹ Emerging markets such as China gained importance as Americans became more health-conscious, slowing the domestic sales of snack food.³²

With a rising standard of living, increasingly westernised consumption habits, longer and less regular working hours and an increasing number of two-career households, there emerged a rising demand for convenience food and snacking between meals. In 2003, China's savoury snacks market was worth about US\$1.54 billion [see **Exhibit 1**].³³ Between 2000 and 2005, it grew at an average annual rate of 7.3%.³⁴ Research shows that almost half of Beijing's residents consumed potato chips at least monthly,³⁵ residents of Shanghai spent approximately 9% of their total grocery bill on snacks³⁶ and children in Shanghai spent an average of US\$1 on snack food a week.³⁷ The kids' market in China was filled with potential, as the one-child policy had caused many children to grow up with both parents working and their grandparents taking care of them. Both generations were willing to spend generously on their "little emperors".

Chinese snacks were traditionally sold through street vendors, though these vendors were increasingly replaced by supermarkets and convenience stores that provided new and important venues for premium branded snack lines. Among the different snack foods, potato chips had gained popularity rapidly in China. China's potato chips market was worth about US\$200 million in 2004 and was growing at a rate of 10% per year.³⁸

Major Players in China's Potato Chip Industry

Pepsi

In the mid-nineties, New York-based soft drink company PepsiCo, Inc. wrote off US\$576 million for its overseas soda business when it failed to compete with Coca-Cola. The write-off led PepsiCo to change its international strategy as it realised that it would have a hard time beating Coca-Cola in foreign markets. Instead of competing head-to-head, Pepsi decided to extend its domestic strategy of using its snack food and cereal businesses to counter its

³⁰ US International Trade Administration (9 June 2004) "Snack Foods—2003", <http://www.ita.doc.gov/td/ocg/snacks03.pdf> (accessed 29 May 2007).

³¹ US International Trade Administration (9 June 2004) op cit.

³² Flannery, R. (10 May 2004) "China is a Big Prize", *Forbes*, 173(10), p.163.

³³ Sweets China (2007) "Shanghai—A Lucrative Market", http://www.sweetschina.com/wEnglisch/sweetschina/global/ueber_die_messe/rueckblick/startseite_marketW3DnavidW2628.shtm (accessed 1 September 2007).

³⁴ China CCM (2006) "Savory Snacks in China to 2010", <http://www.chinaccm.com/4S/4S15/4S1510/news/20060908/133852.asp> (accessed 1 January 2007).

³⁵ Curtis K.R., McCluskey, J.J., and Wahl, T.I. (2002) "Is China the Market for Genetically Modified Potatoes?" *AgBioForum*, 5 (4), 175–178, <http://www.agbioforum.org> (accessed 24 March 2007).

³⁶ Marr, J. and Hatfield, A. (1996) "Snack Foods in Shanghai—Market Brief", Foreign Agricultural Service, United States Department of Agricultural Service, http://www.fas.usda.gov/scripts/attacherep/display_gedes_report.asp?Rep_ID=10005455 (accessed 13 May 2007).

³⁷ Marr, J. and Hatfield, A. (1997) "Shanghai Snack Market Geared to Young Buyers", <http://www.fas.usda.gov/info/agexporter/1997/February%201997/shangsnk.html> (accessed 20 March 2007).

³⁸ Flannery, R. (10 May 2004) op cit.

competitor and focused on using its snack food business to build a global presence. The strategy fit well with the shifting trends of snacking worldwide. As Americans became more health-conscious, growth in PepsiCo's snack food business in North America, which accounted for 75% of its profit, slowed. International markets, however, were growing at three times the domestic rate and becoming an increasingly important growth driver for the company.³⁹ Pepsi's snack food business was conducted through Frito Lay, Inc., which held 48% of the salty snacks market worldwide through products such as Doritos corn chips and Lay's potato chips, and accounted for about 65% of PepsiCo's profit.⁴⁰

PepsiCo was one of the first multinationals to enter China after its economic reform. In 1982, it set up a bottling plant in Shenzhen under an agreement with the Chinese government. In 1995, it set up PepsiCo (China) Investment Company in Shanghai, which was responsible for overseeing all of PepsiCo's operations in China.⁴¹

Frito Lay in China

PepsiCo introduced Lay's potato chips to China in 1997. The early years were difficult because the Chinese population knew virtually nothing about potato chips and PepsiCo had to educate them from scratch. Lay's early advertisements in China showed potatoes being sliced to ensure Chinese consumers knew where potato chips came from.⁴² The brand also found it difficult to steer Chinese consumers, with a taste for traditional snacks such as seasoned seaweed and duck gizzards, toward western-style potato chips. "Whenever you go into anything that goes into the mouth, you're going to have a harder time as a multinational", said Thomas Doctoroff, who headed advertising agency JWT's operation in China.⁴³ PepsiCo was willing to innovate and create "differentiated products" that catered to local tastes and support these products with intense marketing campaigns. PepsiCo believed that consumers, especially young ones, were drawn to "global products" that were modern and innovative and it positioned Lay's in China such that most Chinese consumers were not aware that it was an American company.⁴⁴

In order to cater to local tastes, PepsiCo launched a Chinese gourmet chip series with flavours such as Peking roast duck and spicy crab, which came in oriental packaging.⁴⁵ PepsiCo also incorporated the principles of yin and yang, which underlay Chinese medicine and the Chinese concepts of balance and health, into its chips in China. Fried food was considered "heating" in Chinese culture, so in the summer of 2003, Lay introduced lemon-flavoured potato chips dusted with lime and mint, which were consider "cooling". The chips became PepsiCo's best-selling product in China.⁴⁶ It also developed different products to cater to the regional preferences of China: Shanghainese had a sweet tooth, southerners liked their chips salty, westerners liked them spicy and northerners preferred meaty tastes. PepsiCo's continual innovation tapped into Chinese consumers' eagerness to try new things and Lay's business in China continued to grow. The rapid growth of large Western supermarkets, including Wal-

³⁹ Terhune, C. (19 December 2005) "To Take China, Pepsi Turns Farmer" *Wall Street Journal*, p. 20.

⁴⁰ Liu, B. (1 December 2000) "PepsiCo Keen on Salty Snacks", *Financial Times*, p. 34.

⁴¹ Foreign Direct Investment Magazine (1 August 2002) "Pepsi was One of the Earliest Multinationals", http://www.fdimagazine.com/news/fullstory.php/aid/46/Pepsi_was_one_of_the_earliest_multinational_companiesChina.html, (accessed 1 August 2007).

⁴² ABC News (9 September 2002) "FritoLay: Using Potato Chips to Spread the Spirit of Free Enterprise", http://faculty.msb.edu/homak/HomaHelpSite/WebHelp/FritoLay_Spreading_Free_Enterprise_ABC_News_9-9-02.htm (accessed 21 July 2007).

⁴³ Flannery, R. (10 May 2004) op cit.

⁴⁴ ABC News (9 September 2002) op cit.

⁴⁵ Euromonitor (14 December 2006) "Snacking – An Emerging Trend in China" Euromonitor Archive, http://www.euromonitor.com/Snacking_an_emerging_trend_in_China (accessed 21 July 2007).

⁴⁶ Flannery, R. (10 May 2004) op cit.

Mart from the US and Carrefour from France, helped.⁴⁷ In Shanghai, the majority of people purchased all their snack food in supermarkets, which offered more variety and better prices than smaller vendors. PepsiCo focused its marketing on Shanghai when it first launched Lay's chips, with Beijing as its second stronghold before slowly expanding to other parts of China.⁴⁸ It targeted mainly urban areas where 30% of China's population resided and distributed its potato chips mainly through convenience stores. By 2004, about a third of the 13,000 convenience stores in China carried Lay's potato chips and Lay held some 40% of the US\$50 million potato chip market in China.⁴⁹

Pringles

Pringles was created by Proctor & Gamble ("P&G") in 1976 in response to the short shelf life of potato chips and the difficulty in transporting them. Pringles potato chips were made from dehydrated potatoes that were meshed into potato flakes and then pressed into a uniform shape for frying. Their uniform shape allowed them to be stacked neatly one on top of another and stored in air-sealed cans that extended their shelf life to up to a year, much longer than the two-month shelf life of normal fried potato chips.

By 2007, Pringles had spread to more than 100 countries in 45 flavours.⁵⁰ Pringles were produced in P&G's two manufacturing plants in Belgium and the United States and P&G began exporting Pringles to China in 1997. It managed to build a loyal following for the brand despite its high price. By 2004, the yearly sales volume of Pringles in China reached between 5,000 and 8,000 tonnes.⁵¹ Nonetheless, competition with other brands was intense and P&G had to slash Pringles's price in China several times. In 2002, Pringles slashed prices after Frito Lay acquired Dajiabao, a complex chips brand owed by Beijing Xingyun Corp.⁵² Beijing Xingyun was the first domestic player in producing complex chips in China. It was a strong player that increased its market share from about 10% of Pringles's to 25% between 1998 and 1999. PepsiCo's acquisition of Dajiabao expanded Lay's range of potato chip products to cover both the high and low ends of the market and extended its packaging from foil bags to cover air-sealed cans similar to Pringles's, further turning up the competition between the two multinationals.⁵³ Lay's canister was smaller than that of Pringles, making it even more convenient for consumers to carry and store. In 2006, P&G entered into a cooperative agreement with Fujian-based Qinqin Incorporated Co., Ltd to produce Pringles in foil bags while continuing to import potato chips from its manufacturing plant in Belgium.⁵⁴

Other Players

China's potato chip industry was fragmented, with a large number of domestic players who produced at high cost and small scale. Many domestic potato chip companies occupied the lower end of the market in China due to limitations in capital and experience, and resorted to price-cutting in order to survive.⁵⁵ Anecdotal evidence suggested that there was local protectionism in the industry and that it was difficult for potato chip companies to expand beyond their local regions. Only a small number of domestic national players had emerged,

⁴⁷ Terhune, C. (19 December 2005) op cit.

⁴⁸ Flannery, R. (10 May 2004) op cit.

⁴⁹ Xiao, K. (5 June 2006) "Pepsi, Desert and Potatoes", *People's Daily*, <http://mnc.people.com.cn/GB/54849/59580/4436851.html> (accessed 4 March 2007).

⁵⁰ Pringles Website: http://www.pringles-info.co.uk/en_GB/aboutpringles.aspx (accessed 21 July 2007).

⁵¹ Zou, Y. (17 January 2004) "P&G Held Off Producing Pringle Chips in China", *21st Century Business Herald*, <http://finance.news.tom.com/1001/1006/2004118-38746.html> (accessed 25 June 2007).

⁵² Ibid.

⁵³ Zhou, Y. T. (19 February 2002) Baidu.com, <http://zhidao.baidu.com/question/3730177.html?fr=qr13> (accessed 21 July 2007).

⁵⁴ 3Eat.net (13 July 2007) "Pringles: Ten Years in China", <http://news.3eat.net/mq/20070317/28318.html> (accessed 21 July 2007).

⁵⁵ Di, E. (4 April 2005) "The Potato Chips Market: Who can Beat the Three Majors?" *Xiaofei Ribao*, http://www.xfrb.com.cn/xfrbmap/2005-04/04/content_26492.htm (accessed 4 March 2007).

such as Fujian-based Dali Group, which owned the Capico brand. Some Asian brands had also made their mark in the China potato chips market, such as the Philippines-based Lewayway Holdings Co. Ltd's Oshi.

PepsiCo Turns Farmer

PepsiCo's Demonstration Farm

PepsiCo started exploring ways to secure a stable supply of potatoes for the manufacturing of Lay's chips in China way before it introduced Lay's chips in China in 1997. During the early years, staff was sent to buy potatoes at the local market at two a.m., before the potatoes were sold out. But the local variety, which sometimes turned black after frying or came out bitter, did not meet Lay's standard. It was only when PepsiCo managed to purchase 2,000 tones of potatoes from a government-run farm in 1997 that it could launch Lay's, though the purchase covered only three months' supply of Lay's on Shanghai's retail shelves. What is more, the local supply of potatoes was unsteady. PepsiCo had to cancel Lay's launch in Lanzhou three times because of inadequate supply. Without a stable source of raw material, PepsiCo would have to import Lay's chips, a costly operation as Lay's chips were packaged in bags and crushed easily.

Over the next two years, PepsiCo gathered some 20,000 tonnes of potatoes from state-run farms and local cooperatives for the manufacturing of Lay's. PepsiCo had a difficult time gathering potatoes that met Lay's requirements, even though China harvested some 65 million tonnes of potatoes a year.⁵⁶ Lay required a potato variety that was large, round and similar to a baseball in shape and size to accommodate the shape of its chips. Potatoes for producing Lay's chips also had to be low in sugar and water content to ensure that the whiteness of the potato would be preserved after frying, and high in solids to maintain a high yield after processing.⁵⁷ Sourcing the right kind of potatoes was further complicated by the logistical need to deliver the potatoes to the manufacturing plant on an exact schedule.⁵⁸ PepsiCo's difficulties with securing the right kind of potatoes increased as the demand for Lay's potato chips increased.

Ultimately, all of these problems had been brought about by the Chinese government's ban on importing potatoes.⁵⁹ With few choices available, PepsiCo had begun exploring potato farming in China as early as 1993. Since the Chinese government had also banned the import of potato seedlings, PepsiCo experimented with the American *Atlantic* species using vitro potato tuber cultivation technology, investing US\$7 million to establish a potato research centre.⁶⁰ In 1998, PepsiCo decided to build a demonstration potato farm in the Kubuqi desert in Inner Mongolia, one of the largest potato growing areas in China. The 2,470-acre demonstration farm⁶¹ served the double purpose of enabling PepsiCo to learn first-hand the unique conditions of potato growing in China and as a base for PepsiCo to teach Chinese farmers about commercial potato growing. Potatoes were grown mainly as a cash crop among Chinese farmers and intensive education was needed to guide them through the process of

⁵⁶ Zhou, C.Y. (22 March 2006) op cit.

⁵⁷ Flannery, R. (10 May 2004) op cit.

⁵⁸ Asia Intelligence Wire (4 September 2006) "Pepsico's Potatoes Grow in China's Deserts".

⁵⁹ Newsweek (31 January 2005) "The Yin and Yang of Chips", <http://www.msnbc.msn.com/id/6845001/site/newsweek/> (accessed 17 July 2007).

⁶⁰ Yan, G.F. (8 January 2007) "Baishi Shengshi: Zeren Zingzhengli Shi Zenyang Xingchengde?", *Nongbowang*, <http://finance.aweib.com.cn/2006/1/18/7462385.htm> (accessed 7 September 2007).

⁶¹ Terhune, C. (19 December 2005) op cit.

growing potatoes commercially. Manual farming methods and the way Chinese farmers handled potatoes bruised them, making them unsuitable for producing Lay's chips.⁶²

The decision to build the demonstration potato farm in a desert came after careful deliberation. The desert offered PepsiCo the acreage it needed at a low cost and also allowed PepsiCo the option of expanding the farm in the future. Potatoes tended to expand in areas where the soil was loose, causing potatoes to be irregular in shape and uneven on the surface. Growing them in sand would eliminate this problem, as any pockets of space would be automatically filled up by loose sand. The desert also offered long hours of sunlight, which helps the accumulation of solids, an important criterion in the production of potatoes intended for commercial processing. Since the desert land had never been farmed before, it was free of pesticide residue or viruses, making it ideal for experimenting with new species.⁶³

PepsiCo countered the many drawbacks of growing potatoes in a desert—such as a water source that resided three to five metres underground,⁶⁴ the inability of the desert sand to hold fertilisers and water, and a high salt level—with modern technology. The field was laced with chemicals to reduce its salt level. A sprinkler irrigation system was installed and the farm was organised around these sprinklers. The farmland was divided into growth circles of about 65 acres or 135 acres in accordance with the capacity of the sprinkler system, and desert willow and poplars were grown around each growth circle to reduce erosion and to protect the crop from sandstorms, which easily pulled newly-planted potato plants out of the soil. Potatoes were usually planted around May and harvested in September in China. PepsiCo grew wheat and corn after the potatoes were harvested to prevent the wind from engulfing the sand. The wheat and corn were also ploughed back into the fields as fertilisers.

After three years of preparation, the fields were ready for their first crop in 2001. PepsiCo brought in US-based Black Gold Potato Sales, one of its largest suppliers in the US, to help.⁶⁵ Black Gold was founded in 1985 in North Dakota and had expanded to 13 locations across the US by 2007.⁶⁶ But Black Gold was not so lucky in China. During its first season, more than half of the potatoes it planted did not sprout, leaving PepsiCo some 3,000 tonnes short of the potatoes it needed. Black Gold used the same fungicide in China as the one it used in the US, ordering it from a Chinese company, but it appeared that the fungicide it received in China was not the same product, though it bore the same name. Gregg Halveson, Black Gold's president, believed the fungicide his company ordered in China contained fillers that killed the potatoes. After the failure of the first season, Black Gold decided to discontinue its work for PepsiCo in China. Halveson contended that the working conditions in China were too difficult. In the US, the advanced development of the agribusiness industry meant that there were specialised companies for spraying pesticides and harvesting crops. In China, Black Gold had to struggle with even the simplest tasks, such as ordering parts and training workers. The spread of Severe Acute Respiratory Syndrome (SARS) in China that year also made it more risky for Black Gold to stay on in China.

With the departure of Black Gold, PepsiCo decided to run the farm itself using local management.⁶⁷ The Chinese manager was able to communicate better with farm workers, posting large sheets on the walls of the farm's office showing the steps that had to be taken in each stage of the cultivation process, making it easy for the local workers to understand what

⁶² Ibid.

⁶³ Yan, G.F. (8 January 2007) op cit.

⁶⁴ Brand Bullo "Potatoes from PepsiCo's Farm at the Kubuqi Desert in the Inner Mongolia Are as Precious as Eggs", <http://www.brandbulo.com.cn/brandart/2113/21139/index.html>. (accessed 7 September 2007).

⁶⁵ Terhune, C. (19 December 2005) op cit.

⁶⁶ For details, see Black Gold Potato Sales's website: <http://www.blackgoldpotato.com>.

⁶⁷ Asia Intelligence Wire (4 September 2006) op cit.

they had to do. “PepsiCo is not a farming company”, said Bob Shi, operations director for PepsiCo’s snack business in China, “but to build a market we had to take extra steps like this”. Growing its own raw material was not new for PepsiCo. It grew and exported tomatoes, citrus fruits, chili and basmati rice in India.⁶⁸

Other Local Sources

At the same time PepsiCo was building its demonstration farm, it was also cultivating a group of local suppliers that could meet its growing need for potatoes by working with farming associations. The package that PepsiCo offered to local farmers was an attractive one. The average yield of potatoes in China was 10,000 tonnes per acre and the market price ranged between US\$66.3⁶⁹ and US\$79.6 per tonne. PepsiCo provided its supplying farmers with seed potatoes that yielded an average of 20,000 tonnes per acre, and PepsiCo paid local farmers around US\$145.9 per tonne.⁷⁰ In 1996, PepsiCo began cultivating potato suppliers in Jiaozhou of Shangdong province that soon supplied 10,000 tonnes of potatoes for PepsiCo each year.⁷¹

PepsiCo worked closely with their supplying farmers, sending specialists to help them with the preparation work, from making projections to securing water sources for the fields.⁷² PepsiCo supplied contracted farmers with species imported from the US and taught them to strictly follow its potato growing protocols. PepsiCo encouraged local farmers to engage in modernised farming, introducing new technology, pushing farmers to use more mechanical equipment to increase crop size and quality, and helping them to purchase tractors at reduced rates. Nonetheless, changing the local agricultural culture was not easy. Even large state-run farms that would benefit most from mechanised farming were reluctant to change when it took them 200 workers a week to harvest a 75-acre field, working from dawn till the early evening for US\$4 a day, even when PepsiCo could harvest the same in less than 48 hours using modern machinery.⁷³ It was also difficult to find interested farmers with suitable land and a willingness to make the necessary investment.⁷⁴

The Way Forward

Lay’s increasing success in China put pressure on its supply of raw potatoes. Hypermarkets such as Walmart showed little patience when inventories of Lay’s chips ran dry. PepsiCo’s demonstration farm became a success story after the multinational take over its operation, but PepsiCo still faced the challenge of devising a long-term strategy that would ensure a stable supply of potatoes for the production of its chips. Did its success in running the demonstration farm mean that it should integrate backwards vertically to grow its own potatoes? Should it build more of its own farms in China? How would such a decision affect its core business? On the other hand, how viable would it be to contract more farmers to grow potatoes for Lay’s? What was the best way forward for PepsiCo?

⁶⁸ The Hindu (29 March 2005) “PepsiCo Plans to Invest \$300–\$500 Million in India”, <http://www.hindu.com/2005/03/30/stories/2005033004661600.htm> (accessed 1 September 2007).

⁶⁹ US\$1 = RMB7.54 on 9 September 2007.

⁷⁰ Xiao, K. (6 May 2006) “Pepsi, Desert, Potatoes”, *Economic Observer*, <http://biz.163.com/06/0605/13/2IRVD81F00021HSD.html>http://www.chinacsrmap.org/E_Org_Show.asp?CCMOrg_ID=759 (accessed 1 August 2007).

⁷¹ Ibid.

⁷² Ibid.

⁷³ Terhune, C. (19 December 2005) op cit.

⁷⁴ Ibid.

EXHIBIT 1: MARKET VALUE OF SOME PACKAGED FOODS IN CHINA (US\$ MILLIONS)

	2001	2003	2003	2004
Confectionary	3,429.17	3,710.34	4,032.1	4,344.01
Packaged Baked Goods	4,456.27	4,886.94	5,366.91	5,831.09
Biscuits	1,461.00	1,590.35	1,719.38	1,843.43
Ice Cream	2,348.82	2,537.64	2,723.82	2,895.30
Savoury Snacks	1,300.77	1,384.01	1,460.02	1,537.93
	12,96.03	14,109.29	15,302.26	16,451.76

Source: Sweets China (2007) "Shanghai—A Lucrative Market",
http://www.sweetschina.com/wEnglisch/sweetschina/global/ueber_die_messe/rueckblick/startseite_market_W3DnavidW2628.shtml (accessed 1 September 2007).